KNOWLEDGE

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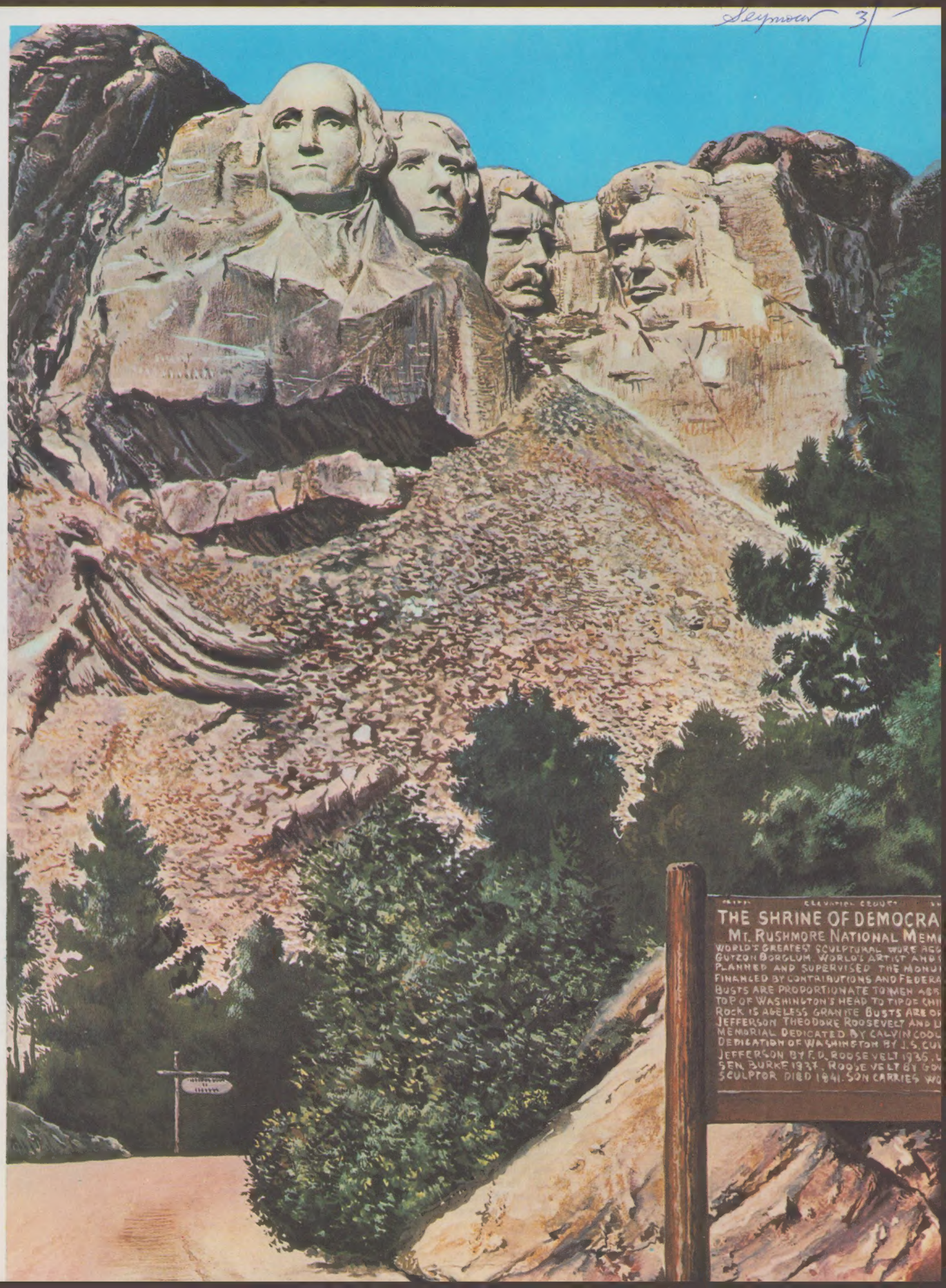

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The storming of the Bastille (1789). *The French revolutionaries went too fast along the road to democracy*

DEMOCRACY

'WE hold these truths to be self-evident, that all men are created equal, that they are endowed by their Creator with certain unalienable Rights, that among these are Life, Liberty, and the pursuit of Happiness. That to secure these rights, Governments are instituted among Men, deriving their just powers from the consent of the governed. That whenever any Form of Government becomes destructive to those ends, it is the Right of the People to alter or to abolish it, and to institute new Government, laying its foundation on such principles and organising its powers in such form, as to them shall seem most likely to effect their Safety and Happiness.' It is in these ringing phrases of the Declaration of Independence that the Americans framed the classic statement of democracy in 1776. Not that democracy began in America, for there were democratic governments in Ancient Greece many hundreds of years before the birth of Christ. And in the 17th century England was the breeding ground for democratic ideas which were not only to influence the British constitution but play a major part in the American Declaration itself.

Nevertheless ever since that 4th July 1776 the United States has been the shrine of modern democracy, standing more or less secure in her ideals while the other major powers went on their sometimes bloody, sometimes peaceful road to a democratic government. And they all travelled that road. For today democracy is the dominant philosophy of government, accepted by the vast majority of countries in the world.

By the time of the First World War (1914–1918) the democratic ideal had conquered most of the civilised nations of the world, excepting Germany, Russia, and the Austrian and Turkish Empires. After that war the Austrian and Turkish Empires collapsed and democratic constitutions were set up in many of the new nations which emerged; the Tsar had been thrown over by revolution in 1917 while the democratic Weimar Republic was set up in Germany. The world, so the victorious Allies believed, had been 'made safe for democracy'.

As we now know they were too optimistic. Hitler and Mussolini overthrew democracy and established dictatorships in Germany and Italy. Yet they themselves fell in the Second World War which, broadly speaking, was a war between the rival ideologies of democracy and fascism.

Fascism is vanquished but democracy is not unchallenged. Today the world stands divided between the democracies of the West and the Communist powers of the East. But so great has been the impact of democracy that the Communists themselves praise it, saying that their system is truly democratic and that in the West, far from everyone being equal as democracy implies, the monied classes ruthlessly exploit the workers. However, as we saw in our article on Communism, the Communist countries, far from being democratic, are in fact dictatorships of the Communist parties. Nevertheless democracy as an ideal is universally accepted. It is time then to look more closely at what we mean by democracy.

The ideals of democracy

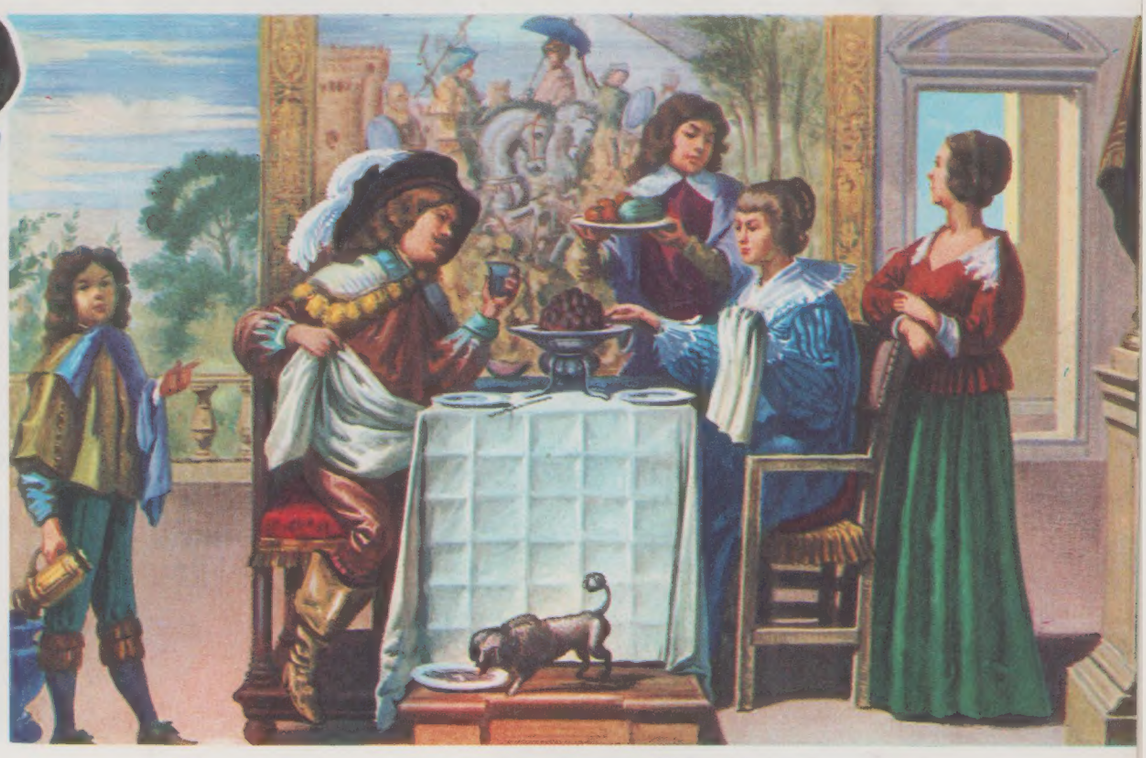
Democracy comes from two Greek words meaning 'rule of the people'. And that basically is what it means – that everybody without exception should have an equal share in governing. In Ancient Greece, city-states like Athens were so small that they could be governed by *direct democracy*; that is, all the citizens could belong to the Assembly which deliberated the affairs of state, while equality was carried so far that important ministers were elected by lot so that everyone should stand an equal chance of being elected. Decisions were taken by majority vote and this is another great ideal of democracy: that even if you disagree with the policy, you submit to the will of the majority.

Previous page: The giant Mount Rushmore National Monument, carved on a granite cliff in the Black Hills of South Dakota, U S A. The four Presidents are George Washington, Thomas Jefferson, Abraham Lincoln, and Theodore Roosevelt. The monument was designed as a tribute to democracy.

DOMESTIC LIFE IN THE 17th CENTURY

A 17th-century gallant sweeps low into a courtly bow with a flourish of his plumed hat

To most of us 17th-century England presents a picture composed of the Gunpowder Plot, the growth of Parliament, Civil War, the Restoration, and the Glorious Revolution. It is the age of Cromwell, the Merry Monarch, and Newton. But what lay behind the glittering list of battles and great men which make up our history books? How did the people live? Would we feel out of place if we were suddenly plunged back in time into 17th-century England?



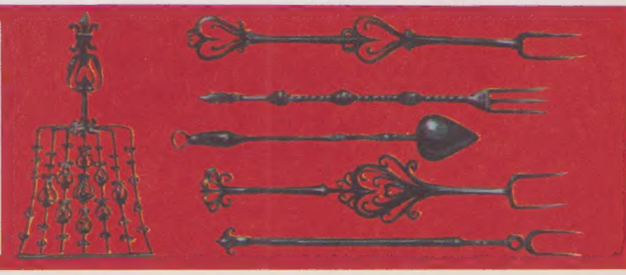
The end of a large meal; notice how the man still has his hat on

IMAGINE yourself in England in the 17th century. The first thing you would notice would be not the people but rather the lack of them; for England then had perhaps 5,000,000 inhabitants, or one-tenth of the present-day figure. The overwhelming majority lived in the country and even the large towns were, by our standards, mere villages. There was one town, of course, which was far larger than all the others – London, which had perhaps half a million inhabitants. Bristol and Norwich, with about 30,000, came next and the rest were very small indeed. Seventeenth-century London was far smaller than today. There were no buildings north of St James's Park or west of St Martin's. Meadows fringed the north of Holborn, while Kensington, Hackney, and Islington were country villages. Poor people lived in hovels on the outskirts of the City, while a popular residential area for the nobility was the south side of the Strand where the huge mansions had gardens running down to the Thames. In the centre of the City all was squalor and filth. The streets were narrow and sewage simply ran down the centre of the streets. There were no public conveniences and in densely populated quarters stinking graveyards were piled up high above the surrounding land.

In fact the habits of our 17th-century ancestors appear to us coarse and revolting; contemporary foreigners winced at the crudity of the English.

The simplicity of the sparsely populated countryside with its little hamlets clustered round a church was entirely different. Here country squires and parsons, yeomen and cottagers, ragged children and squatters, 'made their own wares and their own pleasures after the manner of their ancestors'. Much of England was extraordinarily productive and those with land lived far more prosperously than the rural populations of other countries. This helps to explain the rigorous marriage customs of the countryside. Parents selected suitable consorts for their children according to their own economic standing based on land. There was little falling in love. One 17th-century writer tells of a marriage in Durham: 'she is six years old and he little above eight years old therefore questionless they will carry themselves very gravely and love dearly'.

The nobility of the 17th century loved ornate decoration. Elaborately carved furniture and panelling and intricately worked tapestries adorned their houses. These finely wrought utensils were typical of their taste and craftsmanship.



PASTIMES IN THE CAPITAL

Many Londoners began their work about dawn and finished by mid-day. So they had plenty of time to enjoy all the amenities the city had to offer. There were innumerable eating houses ranging from such magnificent taverns as The Sun in Fish Street to the many little cook-shops where a veal chop, bread and cheese, and beer could be had for a shilling. There were plenty of pubs, especially in Holborn and along the Thames.

Apart from refreshment houses, 17th-century London had, after the Restoration, two licensed theatres – the *King's Theatre* in Drury Lane and the *Duke of York* in Lincoln's Inn. There were also the less sophisticated unlicensed theatres of the *Red Bull* and *Sadler's Wells*. Here more bawdy entertainment was provided, and those who preferred something rougher than even the performances of the unlicensed theatres probably enjoyed themselves at the many cock-fights which took place almost every day.

DRESS

In the 17th century men and women spent proportionately far more on their clothes than we do – one reason being that they did not buy them so often. Clothes were made to last and when they were worn out the material was often used for such things as curtains or chair covers.

To a great extent clothes meant status – a gentleman would wear a finely embroidered coat while a yeoman would make do with fustian. People were therefore prepared to pay high prices for their clothes; when Charles II was crowned the Duke of Buckingham spent £30,000 on his own 'coronation' wardrobe.

Few people had £30,000 to spend in an age when the vast majority earned between 5s and 20s a week. Coat, breeches, and doublet would cost about £8, while ruffles and a lace cravat would cost an extra £3. Shoes cost about 4s a pair and silk stockings 11s. Gentlemen were incompletely dressed without a gilded sword which would cost an extra £2, while a fine hat anything from 20s upwards. For a fashionable nightdress a lady would have to invest five guineas – all this at a time when £1 corresponded to about £15 today.

In the country the poor made do with rough, tough garments which they wore for months, possibly years, on end without a wash or a change. In bed they wore nothing. One of the characteristics of 17th-century England was its dirtiness. Few people washed – from the nobility downwards.

A 17th-century ruff, elaborately stiffened and folded

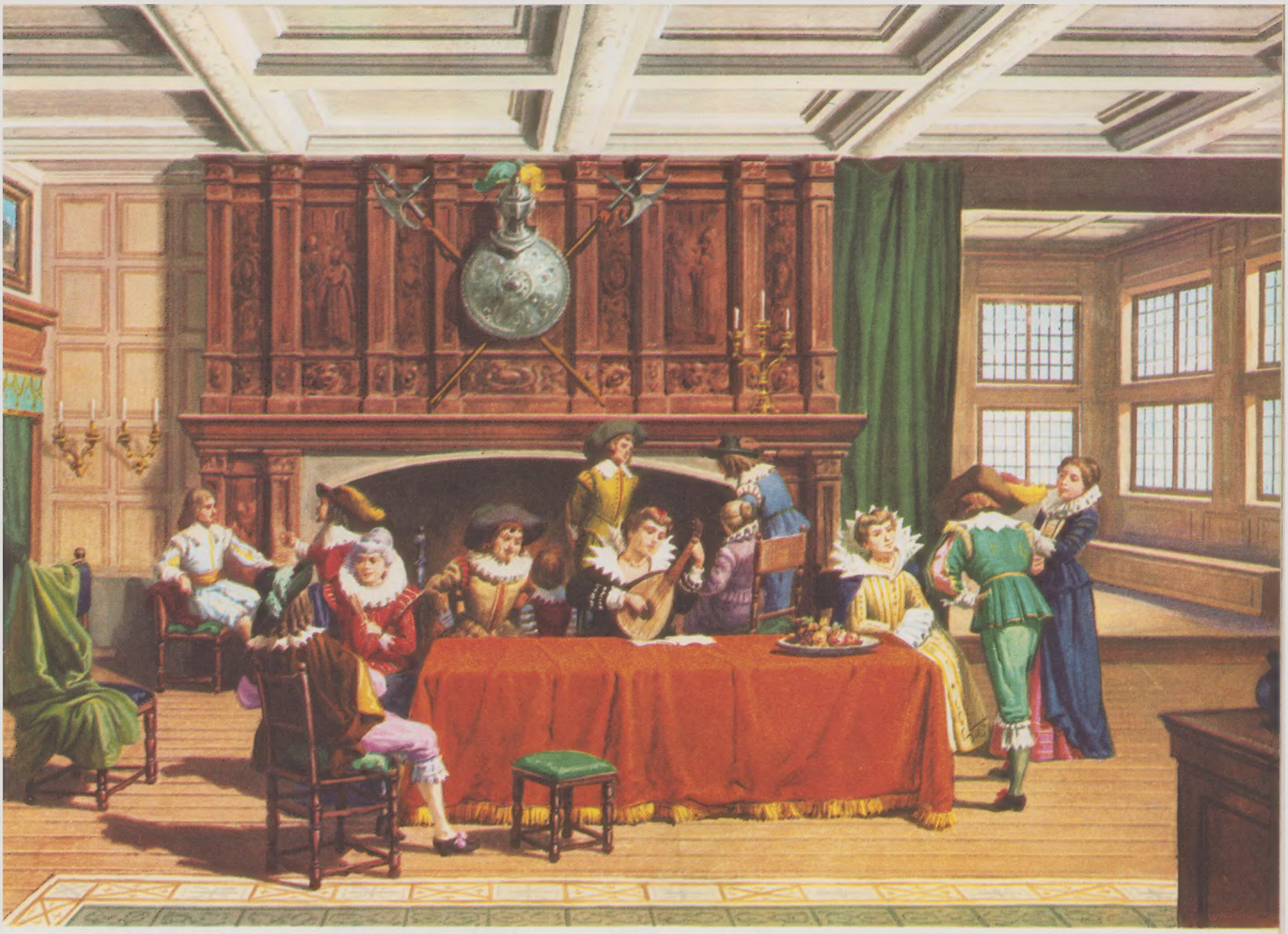
Members of the 17th-century nobility relax and

At table

Our ancestors drank much more than we do and ate less, though what they ate was far more varied. Brewers flourished in 17th-century England and in 1688 12 million barrels of beer were sold – apart from the beer and ale brewed in the home and cider drunk in the West Country! Tea and coffee were only just 'catching on' in Charles II's day. Breakfast was known as 'morning draught' and consisted usually of a mug of ale or a cup of wine. The main meal, dinner, took place around mid-day and varied so much that description is impossible. Samuel Pepys, for example, dined one day on three eels, another on roast beef, and another on 'pease porridge and nothing else'.

Entertaining guests was an elaborate ritual, especially among the nobility. The custom was to cover the table with dishes, the more the better. In 1666 the Duke and Duchess of Ormonde provided 17 dishes for the first course, 17 for the second, and 13 for the third – for 16 guests. The first course may have been boiled meat, baked meat, roast meat, fish, and numerous salads; the second various kinds of game from mallard to peacock with pies and tarts, while the third would be choice sweetmeats. The highest circles provided knives and forks, though usually a knife sufficed. And all guests were expected to bring their own spoons.

What were their table manners like? Towards the end of the 17th century a book called *Rules of Civility* appeared. From its 'don'ts' we can learn what the English in fact 'did'. For example, it says: 'You must not blow your nose publicly at table, or, without holding your hat or napkin before your face, wipe off the sweat from your face with your handkerchief; to claw your head, to belch, and tear anything up from the bottom of your stomach are things so intolerable that they are sufficient to make a man vomit because of them.'



entertain each other after a meal in the hall of a great house

INSIDE A MANSION

The interiors of noble houses were colourful – not only because of the elaborate costumes and dresses of the residents but also because the furnishings were in similar extravagant taste. Huge tapestries hung down from the walls made of heavy material woven with threads of wool, silk, gold, and silver. These threads were woven into figures and picture stories. Also on the walls would be huge paintings, carved panelling, and armour and armaments which might be war trophies won by the master of the house.

The men wore their hats in the house, even when eating. The only time the hat would come off would be during the new-fangled fashion of 'toast drinking', when a guest would address the person next to him who would doff his hat and bow his head. This process might then be repeated all along the table.

The people and their recreation

The character of a 17th-century Englishman was bawdy, loud, and rough. There were no police and fights were frequent, everyday occurrences. On public holidays regular and very energetic battles took place between those traditional enemies the butchers and the weavers. And even in Oxford one don was in the habit of giving a fellow don a black eye whenever he met him. Duels were forever being fought among the lesser gentry, while, when the French Ambassador forgot to light a bonfire to celebrate an English victory over the Dutch, a mob smashed his windows and broke the place up. That ambassador's successor wrote: 'When I reflect that this land produces neither wolves nor venomous beasts I am not surprised. The inhabitants are far more wicked and dangerous.'

There was a great deal of sport. Game shooting was gradually taking the place of hawking, while deer hunting by the great landowners in their forests was very popular. Charles II was a keen deer hunter. Lower down the social scale, hare hunting was popular although fox hunting was only beginning as the 17th century ended.

One sport which made great headway in the 17th century was horse racing. The enthusiastic patronage of Charles II, who was a regular visitor to Newmarket, rapidly made it a new national sport. On at least one occasion King Charles, whose opinion of mediaeval superstition was low, took his astrologer to Newmarket and gave him the humble task of spotting winners!

Other recreations enjoyed by the 17th-century Englishman included the ageless sports of fishing, bowling, and ninepins. Real tennis was played by the aristocracy, while on innumerable village greens could be seen cricket and football matches; however, these bore little relation to the modern games.

SWITZERLAND: economy

FORTUNE has smiled on Switzerland, one of the smallest, yet most beautiful, countries in the world. She is a land of snow-capped mountains, of magnificent lakes and rivers, and of wooded valleys, situated in the heart of Europe and encircled by Germany, France, Italy, and Austria. Switzerland is not only beautiful. She is a prosperous and thriving country with a highly developed economy, and an ingenious and hard-working population.

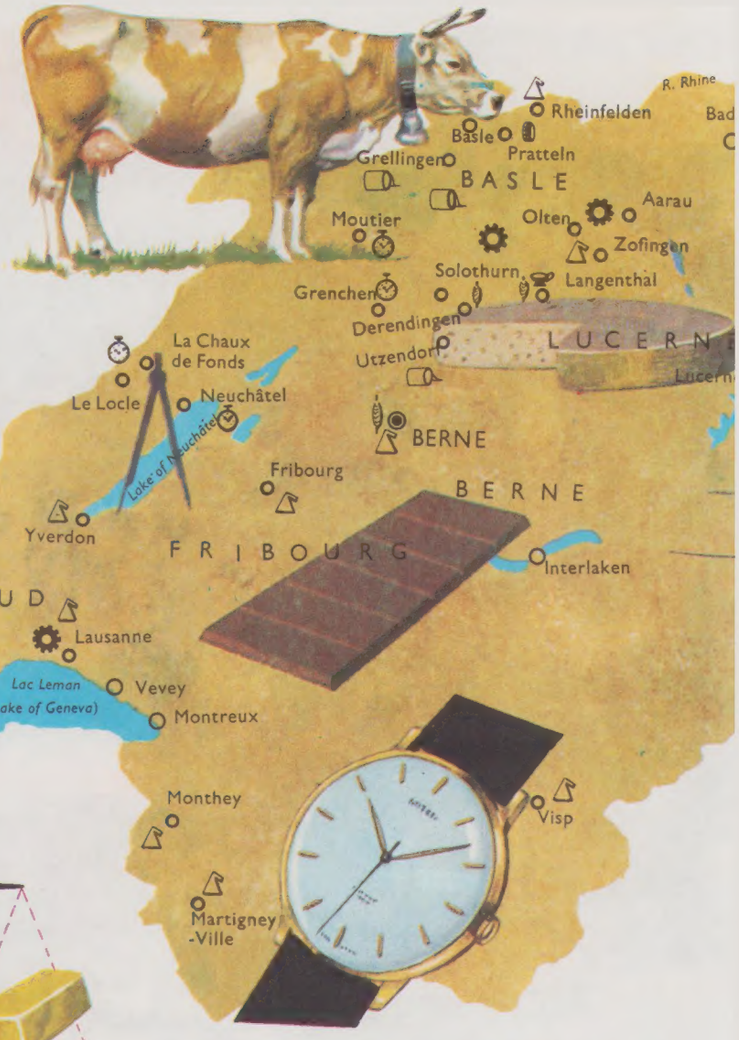
The wealth of Switzerland

Switzerland lacks many of the things which make other countries rich. She has little natural mineral wealth; no coal, oil, precious metals, zinc, copper, or lead, only a little iron ore and manganese, and two salt-mining areas. Nor does she have much fertile soil for agriculture, for Switzerland is the most mountainous country in Europe. Moreover, with no sea coast, she cannot have sea-ports and become a maritime power.

But Switzerland has riches which far outweigh all these disadvantages. She can trade easily with the wealthy countries on her doorstep, and the river Rhine carries Swiss goods from Basle far into Western Europe. The glorious scenery and healthy climate attract thousands of tourists who plough their money into the Swiss economy, while the lakes and fast-flowing rivers can be harnessed to provide hydro-electric energy.

A stable and peaceful political climate is essential to a prosperous economy, and Switzerland, by a policy of strict neutrality, has remained at peace while the other European nations have been locked in battle. It is largely the safety of Switzerland from foreign attack, and her internal stability as a result of a wise democratic government, that lead many foreigners to invest their money in Switzerland, or put it in the great Swiss banks. Likewise Swiss insurance houses have a world-wide reputation for security and integrity, and these too attract vast sums of money from abroad. Swiss currency is one of the safest in the world, and one of the few still backed by gold.

Switzerland has one further advantage – the special skills of the people. A long tradition lies behind present-day Swiss pre-eminence in the manufacture of many highly specialised precision instruments; the world-famous Swiss clocks and watches are a vivid illustration of native ingenuity and skill.



An economic map of Switzerland showing some of the principal cantons

Vineyards on the sunny slopes of Lake Geneva

MANUFACTURING

Swiss industry is largely dependent on engineering, food processing, and chemical, textile, and clothing manufacture. All these are highly developed and expanding, and a first-class educational programme ensures a steady supply of trained men and women to enter industry. The use of cheap hydro-electricity brings power to the factories as well as to isolated villages and compensates for the lack of coal.

Throughout Switzerland cheese, butter, and sugar are manufactured, and in the large cities meat is processed and packed. Large quantities of Gruyère and Emmenthal cheese are exported from Switzerland. But perhaps the food which is most associated with Switzerland is chocolate, for she produces the finest in the world. The Zug

Skill and concentration in a famous Swiss watch factory

MAIN EXPORTS

Machinery, watches, chemicals and pharmaceutical products, textiles, foodstuffs.

MAIN IMPORTS

Metals, machinery, motor vehicles, chemicals and pharmaceutical raw materials, fuel oil, petrol, coal, timber, cereals, fruit, and vegetables.

The Cornegrat – a Swiss mountain railway in Valois, which reaches a height of over 10,000 *feet*

TOURISM

Foreigners play a great role in the Swiss economy. They put their money in Swiss banks and insurance companies, and they provide a high proportion of the labour force – indeed in some towns Italians form nearly one-third of the number of workers.

But they do more than that; they come to Switzerland as tourists, stay in Swiss hotels, eat in Swiss restaurants, and buy in Swiss shops. The Swiss scenery, with its higher mountains covered in snow throughout the year, attracts people from all over the world. In summer the holiday resorts on the lakes and in the mountains, like Geneva, Lausanne, Montreux, Lucerne, Interlaken, and Neuchâtel, are full. In winter the Alpine sports come into their own as thousands ski down the snowy slopes of resorts like St Moritz, Zermatt, Wengen, and Klosters or view the breathtaking landscape from funicular railways and chair-lifts.

Switzerland is a member of the European Free Trade Area. EFTA was formed by Britain in 1959 to lower tariffs and facilitate trade in industrial products as a counterbalance to the European Common Market.

FACTS AND FIGURES

Population	5,560,000
Working population	2,514,400

PERCENTAGE OF WORKING POPULATION EMPLOYED IN:

Agriculture and forestry	11·6%
Metal working, engineering, and watch making	19·4%
Trade, banking, and insurance	13·4%
Catering and transport	9·9%
Building	9·3%
Textile and clothing	6·7%
Other occupations – including food processing	29·7%

MAIN TOWNS

	Population
Berne (capital)	166,100
Zurich	439,600
Basle	205,800
Geneva	179,400
Lausanne	130,500

Chief river port: Basle Currency: Swiss franc

region specialises in chocolate manufacture, and great names among Swiss firms include Suchard, Tobler, Nestlé, and Lindt.

Over a thousand factories produce high-quality watches and clocks, and over 30,000,000 are exported to foreign countries each year. Le Locle and La Chaux de Fonds in particular are famous for watches. The same technical skills help to turn out all kinds of tools, engines, electric motors, turbines, delicate scientific and optical instruments, and jewellery.

The chemical and pharmaceutical industry is centred on Basle, a great river port. Many other industrial centres produce such goods as bricks, glass, cement, and heavy iron and steel goods. Woollen, cotton, and silk goods are also manufactured.

Swiss industry is thus extremely varied; the emphasis everywhere is on specialisation, on skill, on precision, and on quality.

AGRICULTURE

The Alps and Jura mountains occupy 73 per cent of the total area of Switzerland, and much of this land is covered by dense forests, so that cultivation is impossible.

Most of the productive land is meadow and

① Permanent meadow and pasture; ② Forest; ③ Arable; ④ Unproductive.

pasture, used for stock-raising and dairying. There are almost a million cows, whose milk goes into the famous Swiss cheeses, condensed milk, and chocolate. Horses, goats, sheep, and pigs are also kept in large numbers.

The most important crop is wheat, which accounts for two-thirds of all Swiss cereals. Rye, barley, sugar-beet, potatoes, vegetables, tobacco, and fruit are all grown extensively, and wine is produced mainly in the Italian-speaking Ticino districts, and the French-speaking areas around Lake Geneva in the Vaud canton.

THE BOVIDAE

A herd of antelope leaping away to escape

THE sun is setting on the African savannah and in the undergrowth thousands of small animals are stirring – mice, insects, and many others that have slept through the intense heat of the day. Larger animals are moving too. A herd of impala comes into the open from under the trees and sets off in search of pasture. They are pretty, graceful creatures, about 3 feet high at the shoulder. They look fragile, but there is tremendous power in their long, slender legs. Soon they find some fresh, green grass near a clump of trees and start to graze.

Suddenly a shrill chattering of monkeys comes from the trees and the heads of the impala all come up in one sudden movement. They stand, staring at the trees, eyes, ears, and nostrils all alert. Then a cheetah bounds forward from the shadows and they turn and flee. At first they make tremendous leaps, and then settle down to a steady pace of 45 to 50 m p h. But the cheetah can run at over 60 m p h for a short distance. It quickly closes the gap between itself and the herd and strikes down the hindmost animal. The rest run for a few hundred yards and then search for grazing again.

Hollow-horned ruminants

The term *Bovidae* comes from a Latin word meaning oxen, and it seems rather strange to find antelope, sheep, and goats classified together with cattle under this heading. The most important feature common to all the Bovidae is the structure and mode of growth of their horns. These are unbranched and consist of a horny sheath, often hollow, growing from a pair of bony knobs on the skull. They continue growing throughout life and are not shed every year like the antlers of deer.

The Bovidae belong to the Order of mammals called Artiodactyla and the suborder known as the Ruminants, which also includes deer and giraffe. Bovidae are well described by the term 'hollow-horned ruminants', and they fall into three main groups: the oxen or cattle, the sheep and goats, and the antelopes. A few, like the chamois, are intermediate between antelopes and goats. Africa has the greatest variety of Bovidae and there are no indigenous species in Australia or South America.

OXEN or CATTLE. These are nearly all large animals with strong, curved horns. Several kinds have been domesticated and numerous types produced by selective breeding, but there are not very many wild species.

There are two kinds of *domestic cattle*: the familiar type used to produce milk and beef in Europe and other temperate regions, and the

Zebu (*Bos indicus*)

zebu or humped cattle which are found in the hotter parts of Asia and Africa.

the attack of a cheetah. They can run at 45 to 50 m p h, but the cheetah is faster and will catch one of them

The *buffaloes* have very large horns which are flattened at the base, and the hair on the body is scanty. Buffaloes are animals of the tropics and like to spend a lot of their time wallowing in water or mud. The Indian buffalo is domesticated in tropical Asia and runs wild in some places, but it is doubtful if there are any of true wild stock. The wild African or Cape buffalo is a different species and has never been domesticated.

There are two species of *bison*, one North American and the other European. They are large animals with short, curved horns and a thick mane of hair. Both kinds have been in danger of extinction, but their numbers are now increasing under protection.

Persian lamb Cheviot sheep Merino ram

SHEEP and GOATS. These are moderate-sized Bovidae and in their wild state they are all inhabitants of steep, mountainous country. Some have been domesticated for the sake of their meat and milk and their thick wool. There are a number of different breeds of *domestic sheep*, many of which are kept in flat, lowland country, very different from that which was probably the habitat of their wild ancestors. *Domestic goats* are specially useful in dry places with scanty vegetation, as they can find a living where few other herbivorous animals could survive.

A number of species of wild goats and sheep live in mountainous regions in Europe and Asia. The *alpine ibex* is a wild goat with long, curved horns, found high in the Alps; it is now strictly protected in most places where it occurs. The largest wild goat is the *markhor* of Afghanistan and neighbouring countries; its horns are long and spirally twisted. The *mouflon* is a wild sheep found in Corsica and Sardinia. The *chamois* of the Alps and other European mountains is intermediate in its characteristics between goats and antelopes. It lives in the high mountain forests and has short horns, curved back at the tips.

ANTELOPES and GAZELLES. These are the most numerous of the Bovidae and include the most elegant and beautiful of them. By far the greatest number are found in Africa, and a few live in Asia. They vary a great deal in size and appearance. The *impala* can be taken as a typical antelope. It is a graceful, swift, and active animal with horns curved in the shape of an 's'. On its rump is a pattern of black and white markings which enable members of a herd to see and follow each other easily and so keep together. The *eland*, a heavily-built animal as big as a small ox, is the largest of the antelopes. The *beisa oryx* is very beautiful, with long, straight horns and black and white markings on its head. It is closely allied to the *Arabian oryx*, which is now very nearly extinct, although great efforts are being made to save it. The gnus are among the few antelopes that cannot be regarded as beautiful; they have been described as having the body of a horse with the head of an ox. The *brindled gnu* is found in southern Africa.

The gazelles are small, elegant, and graceful antelopes, some of which live in desert country. The *dorcas gazelle* is found around the Sahara desert, and *Soemmerring's gazelle* inhabits East Africa. *Grant's gazelle*, which lives in Kenya and Tanganyika, has longer horns than any other gazelle.

Grant's gazelle (*Gazella granti*)

Note: these animals are not all drawn to the same scale.
Indian buffalo (Bubalus bubalus)
European bison (Bison bonasus)
American bison (Bison bison)
Brindled gnu (Connochaetes taurinus)
Dorcas gazelle (Gazella dorcas)
Soemmerring's gazelle (Gazella soemmerringi)
Impala (Aepyceros melampus)
2456
GB Bertelli

Domestic ox
(Bos taurus)
Alpine ibex
(Capra ibex)
Domestic goat
(Capra hircus)
Eland
(Taurotragus oryx)
Mouflon
(Ovis musimon)
Chamois
(Rupicapra rupicapra)
Beisa oryx
(Oryx beisa)
Markhor (Capra falconeri)

VEGETATIVE REPRODUCTION

WHEN a farmer wants to plant a crop of potatoes he buys what are called 'seed' potatoes and puts them in the ground. These are not really seeds at all; they are just potatoes, specially selected so that they are free from disease. A potato is a tuber, formed by an underground stem, or *rhizome*. A rhizome will generally grow when separated from the plant which formed it, if it has one or more buds on it. It can even be cut up into pieces, and so long as each has a bud, the pieces will grow. The 'eyes' of a potato are such buds. This is called *vegetative reproduction*.

Another example of vegetative reproduction is the 'runner' of a strawberry plant. Long horizontal stems called *stolons* grow out over the ground, and at certain points along them, called *nodes*, leaves and roots grow out to form new plants.

The 'suckers' that often appear around fruit trees are shoots growing up from the roots, and these will also grow if separated from the mother plant. Gardeners often utilise this type of reproduction for propagation. Certain artificial methods of vegetative reproduction are practised as well; these fall under three headings: cuttings, layering, and marcots.

LAYERING

A stem or branch of a plant is brought in contact with the ground. When it has taken root it is separated from the parent plant.

Simple layering from a vine plant

Double layering from a vine plant

Multiple layering of a vine plant

Layering a carnation by pegging down the stem

Layering is practised with plants that are difficult to propagate by cuttings; the young plant has the advantage of getting nourishment from the mother plant while its roots and leaves are forming. Clematis, rhododendrons, and vines are propagated by layering.

MARCOTS

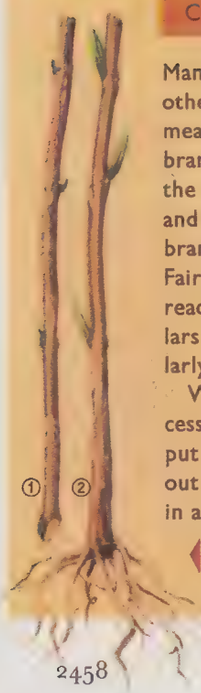
This method is similar to layering, and is used mainly in tropical countries when the branch cannot reach the soil.

Flower pot for marcot

The pot fixed in place

Many kinds of fruit trees can be propagated by using marcots. The process is illustrated on the left. In dry weather the soil in the pot must be kept moist by frequent watering.

CUTTINGS



① Simple cutting ② Young plant obtained from a cutting

Many different kinds of trees and other plants can be reproduced by means of cuttings. A stem or branch is cut off and planted in the soil; roots grow out around and above the severed end and the branch grows into a new plant. Fairly small branches grow more readily than large ones, and poplars and willows respond particularly well.

Watercress illustrates the process very well; a piece of the plant put in a jar of water quickly throws out roots, and can then be planted in a stream.

BREEDING TRUE

One great advantage of vegetative reproduction is that the plants obtained by this method are exactly like the parent plant. This is not the case when plants are grown from seed, because this involves a process of fertilisation in which characters are mixed and tend to produce variation. An apple tree grown from seed is unlikely to produce fruit exactly like that of its parent. Grafting (see page 2159) is a combination of normal and vegetative reproduction. A shoot which will breed true to its parent is grafted on to a stock grown from a seed produced by ordinary fertilisation.

ARISTIDES

Bust of Aristides (Vatican Museum, Rome)

IT was the year 482 B C. An 'ostracism' was being held at Athens. This procedure was a safeguard against one citizen becoming too powerful in the young Athenian democracy, and setting himself up as a dictator. Six thousand votes, written on odd scraps of pottery (*ostraka*), would be enough to banish a man.

On voting-day, an illiterate peasant came up to an honest-looking fellow-citizen named Aristides, not knowing who he was. 'Please write the name Aristides on this ostrakon for me,' he said. Aristides did so. Then he asked the peasant: 'Has Aristides harmed you in any way?' 'No,' the peasant replied. 'Then why do you want him to be ostracised?' 'Because I am sick of hearing him always called "Aristides the Just".'

Aristides the Just

Not much is known for certain about Aristides's life. He was born probably a little before 520 B C, and soon acquired a reputation for justice and honesty. We know that he was one of the ten Generals (*stratêgoi*) at the battle of Marathon (see page 2476), where he supported Miltiades. A year later he was *archonepônymos*, the archon who gave his name to the year (see page 512).

Aristides was in fact ostracised in 482. We do not know the real reason for this. Probably he had opposed Themistocles's policy of building a big fleet (see page 2223). But he was recalled two years later in 480 B C, with other Athenian exiles, and played an honourable part against the Persian invaders.

The Second Persian War

During the Second Persian War Aristides commanded the Athenian land forces. At the battle of Salamis (480 B C) he led the small band of Greek *hoplites* (heavily armed soldiers) who recaptured the little island of Psyttaleia from the Persians, and held it as a haven for Greek ships damaged in the battle. The following year (479 B C) Aristides commanded the Athenian contingent at the battle of Plataea, the final defeat of the Persians in Greece.

On the same day as the battle of Plataea, marines from the Greek fleet, led by the Spartan Leotychidas, won another great victory over the Persians at Mycale.

Now that the freedom of mainland Greece was assured by these two victories, the Spartans sailed home; but the large Athenian contingent stayed to support their kinsmen, the Ionian Greeks of Asia Minor, who had now risen in revolt against the Persians. The Spartans returned the next year, led by Pausanias; but the Ionian and island Greeks could not stand his dictatorial behaviour. Instead they invited Aristides, who was by now the Athenian commander, to take over the supreme command.

An illiterate Athenian peasant, failing to recognise Aristides, asks him to write his own name on an ostracism tablet

The Confederacy of Delos

Sparta was friendly to Athens at this time, and in any case was more interested in mainland Greece. She therefore gave way, and allowed the Athenians and Ionians to form a Confederacy against the Persians. This league is usually called the Confederacy of Delos, because its meeting-place and treasury were on the island of Delos, traditionally sacred to the Ionians.

There were to be two assemblies of equal power: the Athenian state, and the Synod of the Allies. Athens was to command the navy; and each state was to provide ships or money. Aristides was given the delicate task of assessing how much each state should contribute. This he did extremely fairly and to everyone's satisfaction.

Nothing more is known for certain about Aristides. According to tradition, he died a poor man, probably around 468 B C.

NUCLEAR POWER REACTORS

Advanced reactor at Dounreay. The large protective steel sphere encloses the whole reactor and its surrounding equipment

THE world is running out of power – at least, power as we have known it for many hundreds of years. The rapidly dwindling supplies of coal and oil are catering for the ever increasing demands made upon them. In fact, it has been estimated that if we relied on the established methods of generating power, our resources would last out for only another few hundred years; and then the wheels of industry, and of progress, would halt for ever . . . but we do not have to rely on established methods. In 1956 Britain built the first nuclear power station, and opened up untold possibilities, both for good and for evil. For the same fantastic source of energy which in one explosion could wipe out a whole city in a nuclear war, could, properly controlled, provide limitless energy for limitless ages to come.

Enrico Fermi started the first nuclear reactor in 1942. This reactor was not designed to be used as a source of power but scientists soon realised that here was the answer to their problem. It was 14 years later, on 17th October 1956, that Queen Elizabeth opened the first nuclear power station at Calder Hall in Cumberland. Great Britain became the first country in the world to generate large amounts of electricity from uranium in such a way that it could be supplied to the national system of electric power.

Russian ice-breaker Lenin, *powered by a 'pressurised water' reactor*

Nuclear fission

The fuel for a nuclear reactor is usually uranium, so to understand how this fuel is used we must first recall some of the properties of uranium (see page 2358).

When natural uranium is extracted from its ore it is made up mainly of two different types of atom or *isotopes*, with atomic weights 235 (92 protons and 143 neutrons in the nucleus) and 238 (92 protons and 146 neutrons).

In natural uranium there are 140 atoms of isotope 238 (U238) to every atom of isotope 235 (U235). When the central nucleus of isotope U235 is hit by a free neutron it may split into two lighter nuclei, together with two or three neutrons and a large amount of energy. If these neutrons hit further U235 nuclei these nuclei will also split, giving out still more neutrons and so on.

The splitting of a nucleus in this way is called *fission* and the process whereby one nucleus causes a second nucleus to split, which in turn causes more to split, is called a *chain reaction*.

If a free neutron hits a U238 nucleus it is absorbed, but this nucleus does not split, so the neutron is lost and cannot help in the chain reaction.

The Calder Hall reactor

The large commercial nuclear power reactors use natural uranium as a fuel since it is extremely expensive to separate U235 from the more plentiful U238. At Calder Hall each reactor consists of a large cylindrical steel *reactor vessel* 2 to 3 inches thick which is surrounded by a *radiation shield* of special dense concrete 7 to 8 feet thick to protect the workers from any harmful radiation. Inside the steel vessel is the core of the reactor. This contains over 1,500 fuel rods of natural uranium sheathed in magnesium alloy. These rods are spaced apart by over 1,000 tons of pure graphite (a form of carbon) called the *moderator*. There are also channels for *boron steel rods* which can be lowered into the reactor to control it.

How the reactor produces power

Let us suppose that in one fuel rod a U235 nucleus splits; it will give out two or three neutrons plus a large amount of energy in the form of heat. These neutrons are moving very fast and quickly escape from the rod into the graphite moderator; the fast neutrons collide with the nuclei of the graphite (carbon) atoms and lose some of their speed at each collision.

By the time the neutrons wander back into another uranium rod they have slowed down to such a speed that they have a good chance of splitting a U235 nucleus when they collide with it but a poor chance of being absorbed by a U238 nucleus. This process ensures that the neutrons have the best chance of continuing the chain reaction.

The heat formed inside the reactor must be kept constant at a low enough level to prevent the uranium from melting. The amount of heat produced is controlled by the arrangement of the fuel rods and by the boron control rods. When these rods are lowered into the reactor they absorb neutrons and this reduces the number of nuclei that are being split, and so reduces the amount of heat produced.

The heat inside the reactor is removed by passing carbon dioxide gas through it under pressure. The carbon dioxide leaves the reactor at about 350°C and passes into heat exchangers where it gives up its heat to convert water into high-pressure steam. The cool carbon dioxide leaving the exchanger is passed back to the reactor and the steam is used to drive giant steam turbines. These turbines drive generators to produce electric power. The carbon dioxide becomes radioactive inside the reactor, but since it does not mix with the steam in the heat exchangers the steam remains safe and unaffected.

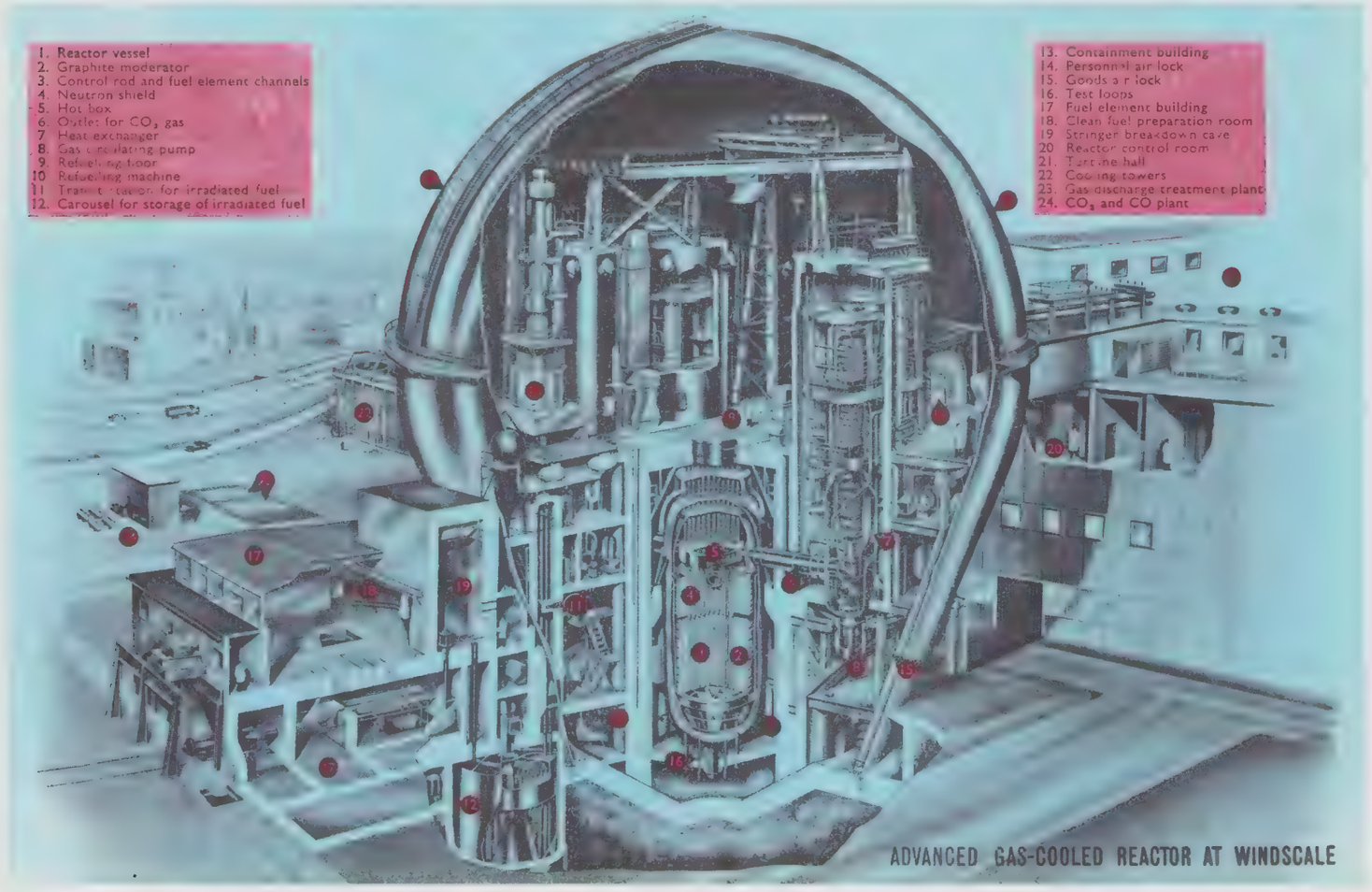
Calder Hall is the first of several similar power stations being built around the coasts of Britain. In more advanced types of reactor such as that at Dounreay in Scotland 50 per cent purified U235 is used. Because the U235 makes up half of each fuel rod there is no need to use a moderator, so the reactor vessel can be made very small, only 2 feet in diameter and 2 feet high. Because the heat is produced in a much smaller volume liquid sodium is used to cool the reactor. Liquid sodium can take up heat more quickly than carbon dioxide gas.

The types of reactor we have described so far are too big or heavy to be used to power ships or submarines. These need a lighter reactor that can be fitted into the hull of the vessel – for example, the *pressurised water reactor*.

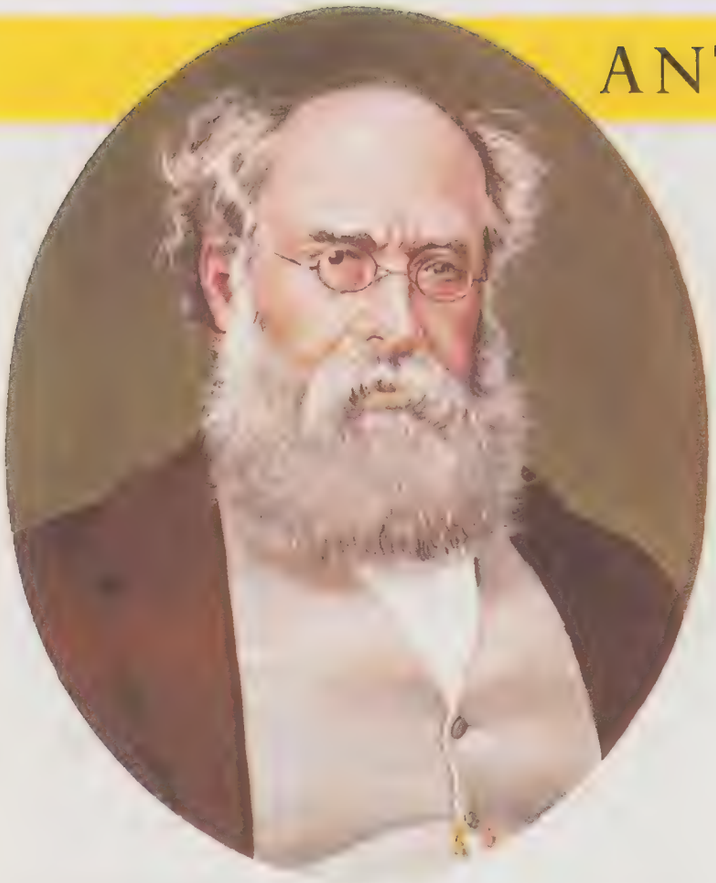
This uses partially purified U235 as its fuel and water as its moderator and coolant. The water is forced into the reactor under pressure where it is heated by the nuclear reaction. It is then taken by pipes to a heat exchanger where it causes water in another system of pipes to turn into steam. The steam then turns the turbines which drive the ship. This reactor has the advantage of being small, light, reliable, and, most important, very safe. Nuclear-powered ships can sail for many months without having to take on more fuel.

Uranium is a very compact form of power. In fact as much power can be obtained from one ton of natural uranium as from 10,000 tons of coal. This means that a nuclear power station can be placed anywhere where power is needed and the supply of cooling water is adequate. It does not have to be continually supplied with the enormous quantities of fuel that coal or oil power stations require. All it needs is a few small compact uranium rods.

Cut-away drawing of an advanced gas-cooled reactor, an improvement on the Calder Hall reactor


1. Reactor vessel
2. Graphite moderator
3. Control rod and fuel element channels
4. Neutron shield
5. Hot box
6. Outlet for CO_2 gas
7. Heat exchanger
8. Gas circulating pump
9. Refuelling floor
10. Refuelling machine
11. Transit route for irradiated fuel
12. Carousel for storage of irradiated fuel
13. Containment building
14. Personnel air lock
15. Goods air lock
16. Test loops
17. Fuel element building
18. Clean fuel preparation room
19. Stringer breakdown cave
20. Reactor control room
21. Turbine hall
22. Cooling towers
23. Gas discharge treatment plant
24. CO_2 and CO plant
ADVANCED GAS-COOLED REACTOR AT WINDSCALE

ANTHONY TROLLOPE



ANTHONY TROLLOPE was very much a professional writer; not in the sense that writing was his only career, for in fact he was an important Post Office official. But he regarded his writing first and foremost as a job, and set aside regular hours of the day for it. Thus instead of writing on inspiration he wrote according to the clock, and the result was prodigious. He wrote some 50 novels and scores of travel books and articles. In his own words: 'My literary performances . . . are more in amount than the work of any other living English author. If any English authors not living have written more . . . I do not know who they are.'

Trollope played, worked, and wrote hard – finding time not only to write but to hunt three times a week and play whist every day, in addition to carrying out his Post Office duties. His literary output was made possible only by fantastic discipline. He rose at 5.30 a m and wrote solidly for two-and-a-half hours at a rate of 250 words every quarter-of-an-hour. He religiously checked his progress as he went along.

Early hardships

It is not surprising that Trollope chose to be a writer, for his mother, Frances, was a novelist as was his brother and sister-in-law. His father, a barrister, devoted much time to a Church Encyclopedia before ruining the family fortunes by taking up farming. Trollope, who was born in 1815, was left in the care of his ill-tempered father while his mother went to America to earn some money. And his childhood was desperately miserable. As a schoolboy he was ragged and dirty, and unpopular because of it. When he left school he became a clerk in the Post Office and from 1834 to 1841 he endured a low salary, constant debts, unhappy love affairs, and perpetual trouble with his superiors. Eventually he broke down and for several weeks hovered on the brink of death.

Yet 1841 was the turning point. Sent to Ireland as a travelling inspector on a higher salary he found he liked the Irish and took at once to fox hunting; in fact he began that combination of hard work and full use of leisure which was characteristic of him. More important he began to think seriously about his cherished ambition to write. In 1844 he married a girl called Rose Heseltine and started a happy married life which lasted nearly 40 years.

Trollope's writings

Trollope's first two novels, *The Macdermots of Ballycloran* (1847) and *The Kellys and the O'Kellys* (1848), were failures. But they illustrate one of his most important characteristics – the use he invariably made of his own experiences and special knowledge. He was, in fact, a literary opportunist. For example, a chance visit to Salisbury Close gave him the idea for *The Warden* (1855). *Barchester Towers* was published in 1857 and with it reappeared Mr Harding, his son-in-law Archdeacon Grantly, and many other clerical figures from *The Warden*. And so began the most famous of all his works – the six novels known collectively as *The Barsetshire Chronicles*. As a novelist he had 'arrived' and soon, as he tells us in his *Autobiography*, he was earning £4,500 a year.

Trollope's business trips took him all over the world and he invariably wrote about his experiences when he returned. His appetite for work was insatiable. Apart from novels and travel books, he helped to found the *Fortnightly Review* in 1865 and edited the *St Paul's Magazine* in 1868. The same year he stood, unsuccessfully, as a candidate for Beverley which provided him with material for several political novels. Among these are some of his famous 'Palliser' series, which, like the *Chronicles*, consist of six novels.

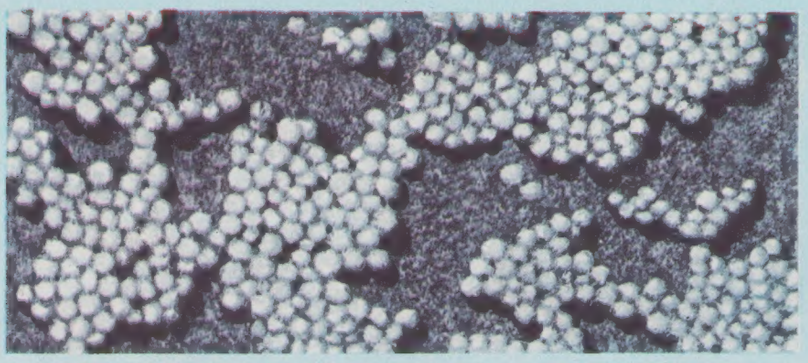
Trollope was transferred by the Post Office from Ireland to England in 1859 and he settled at Waltham Cross. He retired from the Post Office in 1867 and in 1872 moved to London. From there he went to Harting, near the Sussex Downs, where he died on 6th December 1882.

His place in literature

Today Trollope is widely read. Yet 50 years ago he was a 'forgotten novelist'. This is because, more and more, people are realising that his works are a brilliant commentary on mid-Victorian England. His literary style is often awkward and ungainly, and, as he was well aware, he had no talent for constructing a plausible plot. It is in his characterisation that he is supreme, for the characters he creates are, in their way, perfect. He depicts them in their own little worlds of clerical, legal, or political society, and unerringly singles out the often trivial things that really matter to them. He had a wonderful knowledge of the behaviour of the kind of people he wrote about, with the result that his characters really seem to live.

But if Trollope knew *how* people react, *why* they react did not interest him. Psychology lay outside his scope. Indeed he has often been criticised as too superficial. His numerous clerical characters are never disturbed by spiritual anxieties – yet real-life churchmen must be. In fact Trollope did not try to be anything but superficial. He looked on as an outsider at several little worlds within the great Victorian middle-class and painted them, sometimes laughingly, sometimes sympathetically, but with an almost incredible credibility.

INFLUENZA



A photograph of influenza virus particles taken with an electron microscope

EPIDEMICS of influenza occur so unexpectedly and so mysteriously that, before the days of scientific medicine, nothing but the strange powers which the planets were thought to exert over mankind could be found to account for them. Indeed the very name, influenza, records the belief that the epidemics were due to planetary *influence*. However, the discoveries of Robert Koch and of Louis Pasteur at the end of the 19th century made it certain that some diseases, at least, were caused by bacteria. It was therefore no great surprise when, in 1892, Richard Pfeiffer announced his discovery that the bacterium which we now call *Haemophilus influenzae* was the cause of the epidemics.

In the years which followed Pfeiffer's discovery there were many more influenza epidemics, the most devastating being the great *pandemic* which followed the First World War. The number of cases exceeded anything experienced before and it is estimated that 20,000,000 influenza victims died in a single year.

At that time medical science was powerless to prevent influenza and could do little to help the victims. Research continued, however; and in 1933 three British scientists, Wilson Smith, Christopher Andrewes, and Patrick Laidlaw, reported that they had isolated a *virus* from an influenza patient. They thought that this, rather than *Haemophilus influenzae*, was the true cause of the illness. Subsequent research has shown how correct they were. The influenza virus has been studied more intensively than the virus from any other disease and nobody now doubts that it causes epidemic influenza.

Filamentous forms of influenza virus. Magnified 75,000 times

Spherical form of influenza virus. Magnified 75,000 times

TYPES OF INFLUENZA VIRUS

The research on influenza virus soon showed that there was not just one strain of virus responsible for influenza, but many. Several of these strains had much in common and they soon became known as the Influenza A viruses. It was observed that, in general, these were the influenza viruses responsible for large epidemics.

A second group of virus strains came to be called the Influenza B viruses. Though the illness that they cause is unpleasant enough, the viruses in this group do not cause epidemics on a scale comparable to those caused by Influenza A viruses. Nor do Influenza C viruses which were first isolated in 1949.

An attack of influenza by any one of the influenza viruses gives the victim immunity (see page 2260) from a second attack by the same virus strain. However, it does not give complete protection against an attack by a different strain, a fact which explains why someone may suffer from influenza many times.

The disease

Influenza is an infectious disease. Infected people carry the virus in their throats and in their noses, and as they breathe, speak, cough, and sneeze they spread the virus particles into the air around them. Anyone nearby who inhales these particles may become infected and subsequently develop an attack of influenza.

The period between infection and the first signs of the illness, the *incubation period*, is about two days. Usually the first signs are a running nose, sore throat, a headache, and that strange sensation known as 'feeling hot and cold'. At this stage the victim is likely to retire to bed, where he lies for three or four days with a temperature, pains in his back and legs, and a marked distaste for food. Then the recovery begins. The temperature subsides, the pains go, the appetite returns, and the patient begins to take an interest in his surroundings once again. Very often, however, a curious condition called *post-influenzal depression* follows an attack of influenza. This feeling of listlessness and boredom may delay recovery for as long as four weeks.

The prevention of influenza

Since vaccination with appropriate vaccines will protect people from virus diseases as unpleasant as smallpox and yellow fever, it is not surprising that attempts have been made to make and use vaccines for the prevention of influenza. Such vaccines are usually made by growing influenza virus in fertile hens' eggs, harvesting the virus in the egg fluids, concentrating it and then killing it by treatment with a small amount of formalin (H.CHO). The finished product is given by injection.

But vaccination against influenza is less successful than against some other diseases. For in each influenza epidemic the virus tends to be a little different from the virus which caused the previous epidemic, and so a vaccine made from the virus of one epidemic will not always be completely effective against that of another. Influenza vaccine manufacturers usually choose virus strains from recent outbreaks, for these are more likely to resemble the virus in a new outbreak. Of course the best plan in an epidemic is to isolate the virus strain from an early case and quickly make vaccines with it to protect people likely to be attacked later on in the same epidemic. Unfortunately the difficulties of vaccine manufacture are such that this is seldom possible.

No successful alternative

As an alternative to vaccination, many attempts have been made to prevent influenza by the use of natural and synthetic drugs. So far, however, none of the compounds tried has had any lasting success.

L I V E R P O O L

The river Mersey. On the twin towers of the Royal Liver insurance building can be seen two figures of the legendary liver bird

ONE of the largest towns in Britain, and the country's biggest seaport after London, is the Lancashire city of Liverpool. This great city, with its miles of docks, its factories, its cathedrals, and its slums, has a population of 747,500. Its inhabitants are made up of people from all over the world – from Wales, Ireland, China, the Middle East, and the West Indies; and ships leave its docks for world-wide destinations. Yet until the 17th century Liverpool was a comparatively small and unimportant town.

A slow start

Before the river Mersey runs into the sea it forms a sheltered pool, and in the 8th century A D colonies of Norsemen settled there, where Liverpool stands today. It is thought that the city may take its name from the Norse *Hlithar-pollr*, the pool of the slopes. Liverpool was not large enough to be mentioned in Domesday Book (1086), but in 1207 King John made it a borough. This was because he wanted a port for use in his war against Ireland, and a newly created one would be more under his influence than either Chester or Bristol, which had strong trade connections with Ireland. Liverpool slowly built up her own trade with Ireland and nearby Wales, but it was not until the growth of the British colonies in America that Liverpool became really important. Tobacco and cotton from the North American colonies enormously added to Liverpool's prosperity; while sugar from the West Indies, and salt, which came from Cheshire and was exported to the cod fisheries of Newfoundland, were also important items. Ships from Liverpool joined profitably in the slave trade, and the first dock was opened in 1715. Meanwhile, as Chester declined with the silting up of the river Dee, Liverpool took over much of its trade.

In 1700 the population of Liverpool was 5,000; by 1800 it had soared to 75,000. The abolition of the slave trade in 1807 might seriously have affected the town, for at that time Liverpool had 185 ships engaged in the trade. But the rapid growth of the North American trade and the invention of larger, faster ships brought continued prosperity. More and more goods for South Lancashire, the Midlands, and the West Riding of Yorkshire were imported through Liverpool as the Industrial Revolution gathered momentum.

Liverpool expands and prospers

The 19th century was a time of expansion for Liverpool as industries grew up in and around it and overseas trade steadily increased. Canals and railways linked it to other industrial towns, and in 1835 the boundaries of the borough were extended – the first of several such extensions. By 1900 the population was 700,000, a large proportion being composed of the descendants of a flood of Irish immigrants who had arrived during the famines of the 1840s.

The prosperity of the 19th century led to fine buildings and an interest in culture. The Philharmonic concert hall was opened in 1849, and in 1852 the Free Library, museum, and Gallery of Arts, all managed by the city council, were established. In 1877 Sir Andrew Walker built the art gallery which bears his name, and which contains one of the finest collections in Britain. University college, founded by the citizens, was opened in 1882 and grew into Liverpool University.

The vast population of Liverpool made it of special importance to the Church. In 1880 it was made a Church of England see, and the foundation stone of a cathedral was laid in 1904. When completed, this will be the largest in Britain. Because of its high proportion of Roman Catholics Liverpool became a Roman Catholic bishopric in 1850 and an archbishopric in 1911; several of its archbishops have become Roman Catholic Primates of England.

Commercial success

The world trade which caused Liverpool's growth is still carried on today, and the industries which have grown up in the district have to a large extent been based on direct imports. They include flour milling, sugar refining, oil refining, soap manufacture, and rubber. Other industries include engineering and chemical manufacture. Liverpool is the port of registry of the great Cunard liners like the *Queen Elizabeth* and the *Mauritania*, though these, and many of the other great passenger ships, now sail from Southampton.

In fact Liverpool, with its high population and its diversified industries, provides a contrast to many other northern towns whose declining fortunes have led to the present-day 'drift to the south'.

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Today it is obviously not possible to consult everybody about everything. So modern democracy means a system of *representation*. The people elect representatives (like Members of Parliament) and agree to abide by their decisions. If, however, the mass of the people do not like the government's policies they can, in a democracy, elect a new one. The rights of the people to change governments are safeguarded by such means as regular elections and voting by secret ballot to ensure that pressure is not brought to bear on the voter.

In Great Britain elections are held at least once every five years. In some ways it would be more democratic to have them every few months, but this is clearly not *practical*. Governments must have time to plan, and put their policies into operation.

Three important points

Democracy, unlike Communism or Nazism, cannot be traced to any one particular man or even to any one particular book. There have been, of course, great democratic thinkers – Locke and Mill in England, Jefferson and Madison in the United States – but none of them thought they were creating a system. In fact they thought that they were simply stating the obvious – so obvious that they justified their theories solely on the grounds that they were 'self-evident'.

But, you may wonder, if these ideas were self-evident why were they not thought of and acted upon in, say, the Middle Ages? This brings us to our second point: that democracy is not a set of rules but something that *evolves out of political consciousness*. As any one group comes to have influence, so it wants to have power. For example, it simply could not have occurred to the average man of the 12th century that he should have a say in the government – yet in 17th-century England, because the Crown was becoming poorer and the middle classes were getting richer, it became obvious that the latter should have a say in the policies they were paying for by taxation. Then in the 19th century people began to realise that the worker himself was important and that he should have a say in the government. So the vote was extended to all classes, and in the 20th century it was extended to women.

'*Not so very unreasonable!!! Eh?*' *A* Punch *cartoon of* 1848 *showing a Chartist presenting a petition to Lord John Russell. The Chartists were democrats who campaigned in the mid-19th century for many rights which have subsequently been granted*

Riots at Marble Arch (1867) – *the common man demands a vote*

You are probably thinking 'but I thought England became a democracy in the 17th century'. This illustrates our third important point. Democracy is not a method of government but a state of principles on which many different kinds of government can be based. This is in contrast to, say, a monarchy which is *always* governed by a sovereign; or an oligarchy which is *always* governed by a clique. However, both monarchies and oligarchies can, on occasions, be democratic.

It was certainly democratic for the Whig landowners to take some power from the king in 1688, and it was more democratic to give the vote to the industrial middle classes in 1832, and still more democratic to give it to women in 1918. But since democracy is a state of self-evident principles, you cannot criticise a democratic nation for not thinking of things which only become self-evident centuries later. It was not self-evident in the 18th century that the lower class should vote for the government. It would have been very democratic but also very foolish since most of them could not even read or write. Similarly, though less understandably, it was not self-evident to the Americans that the rights which so obviously belonged to them also belonged to the negroes. To some it is still not obvious.

Now you can see why, although it is possible to say there are steps which would make a country more democratic, that is not necessarily to say it should take those steps. For, we must repeat, democracy does not say how to govern, but only what a government should aspire to. You therefore judge a democracy on how far it safeguards the 'natural rights' which democrats believe all men have. Thus, while it would be very democratic for, say, the army to have a general vote on their field-marshal's plan of attack, in practice it would no doubt end up with the complete loss of the war, which is just as self-evidently wrong as a vote for every man is self-evidently right.

That is what was wrong with the French Revolution. The revolutionaries tried to impose a democratic constitution in-

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Democracy *Cover*
Domestic life in the 17th century *2449*
Switzerland: economy *2452*
The Bovidae *2454*
Vegetative reproduction *2458*

contents

Aristides *2459*
Nuclear power reactors *2460*
Anthony Trollope *2462*
Influenza *2463*
Liverpool *2464*

contents

stead of allowing it to evolve. So while they provided the excellent slogans 'liberty, equality, and fraternity', they also let themselves in for a reign of terror and suffered, together with Europe, under the tyranny of Napoleon.

Use of the word

Democracy is difficult to define. Since it originated as a desire to curb the authority of the government over the individual it usually means a written constitution safeguarding the rights of the people. Since monarchies were despotic, democracies are usually republics. There are, of course, exceptions. Great Britain herself is one – she has both an unwritten constitution (though a set of traditions and precedents) and a constitutional monarchy. Even so most people would think she was more democratic than, say, France, which has a written constitution and is a republic, yet gives preponderant powers to her President.

The rights safeguarded in democracies are almost invariably freedom of speech, freedom of the press, freedom of movement, the right to vote, and equality before the law. Since one of the basic rights of the individual is security, democracies also tend to provide welfare benefits, though these vary from country to country. The machinery of government is almost always elected representatives in a Parliament. The elaborate procedures of election, debate, and voting which go with a parliamentary system mean a certain loss of efficiency in carrying out policies. For this reason it is often said that democracies are bad at war and in the World Wars it was indeed found necessary to impose military service and suspend some democratic rights – like, for example, freedom of movement – for those who were subversive.

In all, you can see that democracy is a rather vague word, though as an ideal of government its principles are clear. Certainly few people today would consider a government a just one if it failed to recognise democratic ideals.

Democracy has come to be an almost emotional word, rather like 'Christian'. If we describe somebody's attitude as democratic we are praising it, whether they are selecting a football team, or employing staff, or choosing friends; for most people would agree that what it stands for is the best attitude that a government can take to those it governs, and a person can take to his neighbours.

1914. *Suffragettes are led away by police after attacking Buckingham Palace in their 'votes for women' campaign*

Thomas Woodrow Wilson was the American President at the time of the Treaty of Versailles which decided the fate of Europe after the First World War. His '14 points', which were adopted as a basis for discussion, were strongly democratic. He was one of the dominant voices at Versailles and believed he had 'made the world safe for democracy'

A democratic constitution

Let us look briefly at the constitution of the United States, a constitution constructed on democratic principles.

The Federal government (like the individual state governments) is based largely on two principles: that the people bind themselves to accept the decisions of the majority; and that there should be a rigid 'separation of powers'. This means that the *executive*, *legislative*, and *judicial* aspects of government are separated so that no one body will have too much power. The Federal government deals with the most important business, like defence, foreign policies, and currency, leaving less important matters to the states.

The legislative consists of the two Houses of Congress: the Senate (two senators from each state are elected for a term of six years) and the House of Representatives with representatives elected for two years from every state in numbers varying with the population of each state. The Senate therefore represents the states, the Representatives the people. Legislative decisions are based on simple majorities in both houses.

The executive consists of the President together with his officials and the ten departments. Among these departments are: state (foreign affairs), defence, justice, and the treasury. The President is elected by popular vote for a term of four years. He can be re-elected only once.

The judicial branch is headed by the Supreme Court which is the final judge in disputes arising between Federal and state governments. It also has the power to declare any statute null and void as not in accordance with the constitution. The nine judges are appointed for life and vacancies are filled by the President.